UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/440,093	11/15/1999	KAZUTOSHI YASUNAGA	P18663.P01	2522

7055 7590 03/25/2004

GREENBLUM & BERNSTEIN, P.L.C.
1950 ROLAND CLARKE PLACE
RESTON, VA 20191

EXAMINER	
OPSASNICK, MICHAEL N	
ART UNIT	**PAPER NUMBER**
2655	15

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/440,093	YASUNAGA ET AL.	
	Examiner	Art Unit	
	Michael N. Opsasnick	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2004* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4-7* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 2-9,14-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449).

As per claims 2-9,14-23, Hayashi et al (5970444) teaches a code excited linear prediction speech decoder (Fig. 2, col. 3 lines 64-65, referring to the type of coder – CELP, col. 3 lines 60-63) and a method of producing synthesized speech (Fig 2., output of synthesis filter) comprising:

"an adaptive codebook....code vector" as adaptive codebook (Fig. 2, subblock 35)

"a random codebook.....code vector" as random codebook (Fig. 2, subblock 36)

"a synthesis filter that receives a signal....adaptive code vector...random codevector" as 'synth fil' receiving a combination of the adaptive code vector and a random codevector (Fig. 2, subblocks 35 and 36);

"said random codebook comprising:

"an input vector providing system capable of providing and input vector comprising at least one pulse.....predetermined position...polarity" as random codebook containing position, pulse, and polarity (col. 2 line 63 – col. 3 line 13);

"a fixed waveform storage.....waveform" as storing the fixed waveform in the codebook structure (fig. 5)

Hayashi et al (5970444) does not explicitly teach convolving the impulse response of the filter with the signal, however, Yip et al (5187745) teaches the convolution of the impulse response function with the signal (col. 12 lines 9-13). Therefore, it would have been obvious to one of ordinary skill in the art of codebook design to modify the teachings of Hayashi et al (5970444) with a convolution as disclosed by Yip because it would advantageously reduce the computational complexity of the codebook (Yip, col. 12 lines 14-20).

The combination of Hayashi et al (5970444) in view of Yip et al (5187745) does not explicitly teach a determination of voiced/unvoiced speech, nor a pulsed voiced codebook, and a random unvoiced codebook, however, Tzeng (5293449) teaches a reference codebook structure that can switch (Fig.4, subblock 406) between an unvoiced codebook (Fig. 4, subblock 410) and voiced codebook (Fig. 4, subblock 408), and an excitation vector output from either codebook based upon the type of speech determined from a V/UV decision (col. 4 lines 45-63); and a summation (Fig. 8, subblocks 880). Therefore, it would have been obvious to one of ordinary skill in the art of speech coding/synthesis to modify the teachings of Hayashi et al (5970444) in view of Yip et al (5187745) with a split codebook/codevector structure (as taught by Tzeng)

because adapting a V/UV codebook structure/synthesis would provide a more efficient coding process and a improved speech quality (Tzeng (5293449),col. 3 lines 15-23).

As per claim 2, the recited claim limitations (and associated rejections) common to claims 2-9,14-23 have been presented above. Furthermore, the combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) teaches:

> "an arranging system....position and polarity.....to generate said random code vector comprising said arranged at least one fixed waveform" as the structure of the codebook is arranged according to pulse number, track, and position (Hayashi et al (5970444), fig. 5 -- further referring to figs. 6-8), and generating a fixed waveform (to compare to the input speech waveform -- col. 6 lines 40-58)

As per claims 3,5, the recited claim limitations (and associated rejections) common to claims 2-9,14-23 have been presented above. Furthermore, the combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) teaches:

> the random codebook generating different random codevectors and random codevectors are generated by arranging different waveforms (Tzeng (5293449), col. 9 lines 15-25, using the codebooks noted in col. 9 lines 50-60).

As per claims 4,5, the recited claim limitations (and associated rejections) common to claims 2-9,14-23 have been presented above. Furthermore, the combination of Hayashi et al

(5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) teaches modified random codevectors (Tzeng (5293449), col. 12 lines 56-65).

As per claims 6-9, the recited claim limitations (and associated rejections) common to claims 2-9,14-23 have been presented above. Furthermore, the combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) teaches:

"a shifting system....position and polarity.....to generate said random code vector comprising said shifted at least one fixed waveform" as the structure of the codebook is arranged according to pulse number, track, and position (Hayashi et al (5970444), fig. 5 -- further referring to figs. 6-8), and generating a fixed waveform (Hayashi et al (5970444) to compare to the input speech waveform -- col. 6 lines 40-58).

As per claims 7,9 the recited claim limitations (and associated rejections) common to claims 2-9,14-23 and 6-9 have been presented above. Furthermore, the combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) teaches:

the random codebook generating different random codevectors and random codevectors are generated by arranging different waveforms (Tzeng (5293449), col. 9 lines 15-25, using the codebooks noted in col. 9 lines 50-60).

As per claims 8,9, the recited claim limitations (and associated rejections) common to claims 2-9,14-23 and 6-9 have been presented above. Furthermore, the combination of Hayashi

et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) teaches modified random codevectors (Tzeng (5293449), col. 12 lines 56-65).

As per claims 14,15,17 the recited claim limitations (and associated rejections) common to claims 2-9,14-23 have been presented above. Furthermore, the combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) teaches using the technique as a method of producing synthesized speech (Hayashi et al (5970444), fig. 2, output of the 'synth fil') and also arranging/shifting and modifying the fixed waveform according to the position and polarity of at least one pulse {(as the structure of the codebook is arranged according to pulse number, track, and position (Hayashi et al (5970444), fig. 5 -- further referring to figs. 6-8), and generating a fixed waveform (to compare to the input speech waveform -- col. 6 lines 40-58)}

As per claims 16,17, the recited claim limitations (and associated rejections) common to claims 2-9,14-23, and 14,15,17 have been presented above. Furthermore, the combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) teaches adding the modified waveforms (Tzeng (5293449),as summation (Fig. 8, subblocks 880))

As per claim 18, the recited limitations (and associated rejections) common to claims 2-9, and 14-23 have been presented above. Furthermore, the combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) teaches adding the

modified waveforms in the random codebook (Tzeng (5293449),as summation (Fig. 8, subblocks 880), as applied to the modified waveforms (Tzeng (5293449), col. 12 lines 56-65)

As per claims 19,21,23 the combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) teaches using the technique as a method of producing synthesized speech (Hayashi et al (5970444), fig. 2, output of the 'synth fil') and also arranging/shifting and modifying the fixed waveform according to the position and polarity of at least one pulse {(as the structure of the codebook is arranged according to pulse number, track, and position (Hayashi et al (5970444), fig. 5 -- further referring to figs. 6-8), and generating a fixed waveform (to compare to the input speech waveform -- col. 6 lines 40-58)}

As per claims 20,22 the recited claim limitations (and associated rejections) common to claims 2-9,14-23 have been presented above. Furthermore, the combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) teaches a reference codebook structure that can switch (Tzeng (5293449),Fig.4, subblock 406) between an unvoiced codebook (Tzeng (5293449),Fig. 4, subblock 410) and voiced codebook (Tzeng (5293449) ,Fig. 4, subblock 408), and an excitation vector output from either codebook based upon the type of speech determined from a V/UV decision (Tzeng (5293449),col. 4 lines 45-63). Examiner also equates the first and second set of fixed waveforms, either partially or as a whole, as claimed in claims 20,22, to the codebook structure for voiced and unvoiced, respectively, as presented in the combination rejection for claims '2-9,14-23) above.

3. Claims 10-13,24,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) in further view of Ozawa (5826226).

As per claims 10-13,24,25, Hayashi et al (5970444) teaches a code excited linear prediction speech decoder (Fig. 2, col. 3 lines 64-65, referring to the type of coder – CELP, col. 3 lines 60-63) comprising:

"an adaptive codebook....code vector" as adaptive codebook (Fig. 2, subblock 35)

"a random codebook.....code vector" as random codebook (Fig. 2, subblock 36)

"a synthesis filter that receives a signal....adaptive code vector...random codevector" as 'synth fil' receiving a combination of the adaptive code vector and a random codevector (Fig. 2, subblocks 35 and 36);

"said random codebook comprising:

"an input vector providing system capable of providing and input vector comprising at least one pulse.....predetermined position...polarity" as random codebook containing position, pulse, and polarity (col. 2 line 63 – col. 3 line 13);

"a fixed waveform storage.....waveform" as storing the fixed waveform in the codebook structure (fig. 5)

Hayashi et al (5970444) does not explicitly teach convolving the impulse response of the filter with the signal, however, Yip et al (5187745) teaches the convolution of the impulse response function with the signal (col. 12 lines 9-13). Therefore, it would have been obvious to one of ordinary skill in the art of codebook design to modify the teachings of Hayashi et al

(5970444) with a convolution as disclosed by Yip because it would advantageously reduce the computational complexity of the codebook (Yip, col. 12 lines 14-20).

The combination of Hayashi et al (5970444) in view of Yip et al (5187745) does not explicitly teach a determination of voiced/unvoiced speech, nor a pulsed voiced codebook, and a random unvoiced codebook, however, Tzeng (5293449) teaches a reference codebook structure that can switch (Fig.4, subblock 406) between an unvoiced codebook (Fig. 4, subblock 410) and voiced codebook (Fig. 4, subblock 408), and an excitation vector output from either codebook based upon the type of speech determined from a V/UV decision (col. 4 lines 45-63); and a summation (Fig. 8, subblocks 880). Therefore, it would have been obvious to one of ordinary skill in the art of speech coding/synthesis to modify the teachings of Hayashi et al (5970444) in view of Yip et al (5187745) with a split codebook/codevector structure (as taught by Tzeng) because adapting a V/UV codebook structure/synthesis would provide a more efficient coding process and a improved speech quality (Tzeng (5293449),col. 3 lines 15-23).

The combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) does not explicitly teach a convolution system capable of convolving at least one fixed waveform in accordance with the position and the polarity of said at least one waveform {(Hayashi et al (5970444) teaches arrangement of the codebook/codevector according to pulse number, track, and position (Hayashi et al (5970444), fig. 5 -- further referring to figs. 6-8), and generating a fixed waveform (to compare to the input speech waveform -- col. 6 lines 40-58)}; Ozawa (5826226) teaches a convolution calculation (col. 7 lines 4-22) utilizing the

codebook (col. 7 lines 22-30), according to polarity and pulse position (col. 2 lines 55-60); (col. 12 lines 47-51). Therefore, it would have been obvious to one of ordinary skill in the art of codebook structures to modify the teachings of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) with a convolution calculation in the random codebook so that the distortion would be minimized (Ozawa (5826226), col. 7 lines 1-5).

As per claims 11,13 the recited claim limitations (and associated rejections) common to claims 10-13 have been presented above. Furthermore, the combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) in further view of Ozawa (5826226) teaches:

the random codebook generating different random codevectors and random codevectors are generated by convoluting different waveforms (Ozawa (5826226), col. 7 lines 4-15,col. 7 lines 22-30,col. 2 lines 55-60,col. 12 lines 47-51)

As per claims 12,13, the recited claim limitations (and associated rejections) common to claims 10-13 have been presented above. Furthermore, the combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) in further view of Ozawa (5826226) teaches:

the random codebook generating different random codevectors and random codevectors are generated by modifying different waveforms (Tzeng (5293449), col. 9 lines 15-25, using the codebooks noted in col. 9 lines 50-60).

As per claims 24, 25, the recited limitations (and associated rejections) of common elements to claims 10-13 have been presented above. Furthermore, As per claims 14,15,17 the recited claim limitations (and associated rejections) common to claims 2-9,14-23 have been presented above. Furthermore, the combination of Hayashi et al (5970444) in view of Yip et al (5187745) in further view of Tzeng (5293449) in view of Ozawa ((5826226) teaches using the technique as a method of producing synthesized speech (Hayashi et al (5970444), fig. 2, output of the 'synth fil').

Response to Arguments

4. Applicant's arguments have been considered but are moot in view of the new grounds of rejection.

Conclusion

5. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231
or faxed to:
(703) 872 9314,
(for informal or draft communications, please label "PROPOSED" or "DRAFT")
Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Opsasnick, telephone number (703)305-4089, who is available Tuesday-Thursday, 9AM-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Doris To, can be reached at (703)305-4827. The facsimile phone number for this group is (703)872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 2600 receptionist whose telephone number is (703) 305-4750, the 2600 Customer Service telephone number is (703) 306-0377.

mno
3/11/2004

DORIS H. TO 3/12/04
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600